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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/692,820	10/27/2003	Shinichi Kojima		9668

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EXAMINER

SONG, HOON K

ART UNIT PAPER NUMBER

2882

DATE MAILED: 07/27/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/692,820	KOJIMA ET AL.	
	Examiner	Art Unit	
	Hoon Song	2882	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 28-46 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☐ Claim(s) 28-32 and 34-46 is/are rejected.
- 7) ☒ Claim(s) 33,37,40,43 and 45 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 27 October 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☒ Certified copies of the priority documents have been received in Application No. 10/098,593.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date ____ | 6) <input type="checkbox"/> Other: ____ |

DETAILED ACTION

Claim Objections

Claim 43 is objected to because of the following informalities:

Regarding claim 43, on line 1, "comprisses" should read --comprises--.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 28, 30 and 36-46 are rejected under 35 U.S.C. 102(e) as being anticipated by Saoudi et al. (US 6448559B1).

Regarding claim 28, Saoudi teaches a radiological imaging apparatus comprises:

a bed (116) for carrying a test subject; and

an image pickup apparatus (10), wherein said image pickup apparatus comprises:

a radiation detector ring structure (figure 2) that detects radiation from said test subject (108) and includes a plurality of radiation detectors arranged in a ring form (figure 2);

an X-ray source (106) that irradiates said test subject with X-rays; and

an X-ray source transfer apparatus that transfer said x-ray source in the circumferential direction of said radiation detector ring structure (column 6 line 59).

Regarding claim 30, Saoudi teaches said X-ray source moves in a circumferential direction of said radiation detector ring structure inside said radiation detector ring structure (figure 2).

Regarding claim 36, Saoudi teaches said radiation detector is a semiconductor radiation detector (column 5 line 64).

Regarding claim 37, Saoudi teaches said respective radiation detectors output both a first detection signal which is the detection signal of said X-rays which is one type of said radiation that have passed through said test subject and a second detection signal which is the detection signal of gamma-rays which is another type of said radiation radiated from said test subject (column 4 line 63).

Regarding claim 38, Saoudi teaches a controller that instructs said X-ray source to radiate and stop radiating X-rays alternately and to radiate X-rays for a set time. axial direction of said radiation detector (pulsed mode).

Regarding claim 39, Saoudi teaches a tomographic image data creation apparatus that creates first tomographic image data of said test subject based on said first detection signal, creates second tomographic image data of said test subject based on said second detection signal and creates fused tomographic image data combining said first tomographic image data and said second tomographic image data (column 8 line 40).

Regarding claim 40, Saoudi teaches said radiation detector outputs an output signal including a first detection signal which is the detection signal of X-rays which is one type of radiation that has passed through said test subject and a second detection signal which is the detection signal of gamma-rays which is another type of radiation radiated from said test subject (column 8 line 40).

Regarding claim 41, Saoudi teaches a signal discriminator that separates said first detection signal and said second detection signal from said output signal entered and is connected to each said plurality of radiation detectors (column 5 line 45, column 7 line 8).

Regarding claim 42, Saoudi teaches a tomographic image data creation apparatus that creates first tomographic image data of said test subject based on said first detection signal, creates second tomographic image data of said test subject based on said second detection signal and creates fused combining said first tomographic image data and said second tomographic image data (column 8 line 40).

Regarding claim 43, Saoudi teaches a radiological imaging apparatus comprises:
a bed for carrying a test subject; and
an image pickup apparatus, wherein said image pickup apparatus comprises:
a plurality of radiation detectors that detects radiation from said test subject and is arranged in a ring from;
an X-ray source that rotates together with said radiation detector ring structure and irradiates said test subject with X-rays, and
a drive unit that rotates said radiation detector ring structure.

Regarding claim 44, Saoudi teaches said radiation detector is a semiconductor radiation detector (column 5 line 64).

Regarding claim 45, Saoudi teaches said radiation detector outputs a first detection signal which is the detection signal of X-rays which is one type of said radiation that has passed through said test subject and a second detection signal which is a detection signal of gamma-rays which is another type of radiation radiated from said test subject (column 8 line 21).

Regarding claim 46, Saoudi teaches a radiological imaging method of carrying out an X-ray computed tomographic inspection and PET inspection on a test subject using (abstract):

a radiation detector ring structure (113) including a plurality of radiation detectors which detects radiation from said test subject and which is arranged in a ring form (figure 2);

an X-ray source (106) that irradiates said test subject with X-rays; and
x-ray source transferring means for transferring said X-ray source in the circumferential direction of said radiation detector ring structure (column 6 line 59).

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 28-29, 31 and 35 are rejected under 35 U.S.C. 102(b) as being anticipated by Fetter (Re. 34160).

Regarding claim 28, Fetter teaches a radiological imaging apparatus comprises:
a bed for carrying a test subject (4); and
an image pickup apparatus (10), wherein said image pickup apparatus comprises:

a radiation detector ring structure (6) that detects radiation from said test subject (4) and includes a plurality of radiation detectors arranged a ring form (figure 1);
an X-ray source (1) that irradiates said test subject (4) with X-rays; and
an X-ray source transfer apparatus that transfers said X-ray source direction of said radiation detector the circumferential ring structure (figure 1).

Regarding claim 29, Fetter teaches an X-ray source axial transfer apparatus that transfers said X-ray source the axial direction of said radiation detector ring structure (figure 5).

Regarding claim 31, Fetter teaches said X-ray source moves in circumferential direction of said radiation detector ring structure outside said radiation detector ring structure (figure 1).

Regarding claim 35, Fetter teaches said X-ray source placed outside said radiation detector ring structure in the axis direction of said radiation detector ring structure so that X-rays radiated from said x-ray of said radiation source reach said radiation detectors detector ring structure (figure 1).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 28, 32 and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schittenhelm (US 5125012) in view of Fetter (Re. 34160).

Regarding claim 28, Schittenhelm teaches a radiological imaging apparatus comprises:

an image pickup apparatus (10), wherein said image pickup apparatus comprises:

a radiation detector ring structure (15) that detects radiation from said test subject and includes a plurality of radiation detectors arranged a ring form (figure 7);
an X-ray source (6) that irradiates said test subject with X-rays.

However Schittenhelm fails to teach an X-ray source transfer apparatus that transfers said X-ray source in the circumferential direction of said radiation detector ring structure.

Fetter teaches an X-ray source transfer apparatus that transfers an X-ray source in a circumferential direction of a radiation detector ring structure (figure 1).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the imaging system of Schittenhelm with the rotating x-ray source as taught by Fetter, since the rotating x-ray source of Fetter would reduce the manufacturing cost than source scanning type x-ray source.

Regarding claim 32, Schittenhelm teaches said X-ray source is placed outside said radiation detector ring structure in a direction of a radius of said radiation detector ring structure and said radiation detector ring structure forms a slit (28) that lets X-rays radiated from said X-ray source pass through toward the inside of said radiation detector ring structure (figure 6).

Regarding claim 34, Schittenhelm teaches a collimator (38) through which said X-rays pass is placed between said slit (28) and said radiation detectors (44) and said radiation detectors are placed around said collimator (figure 2).

Allowable Subject Matter

Claim 33 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter:

The prior art fails to teach a plurality of said radiation detector ring structures are placed in the axial direction, and a slit that lets X-rays radiated from said X-ray source pass through toward the inside of said radiation detector ring structures is formed between said radiation detector ring structures as claimed in dependent claim 33.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hoon Song whose telephone number is (571) 272-2494. The examiner can normally be reached on 8:30 AM - 5 PM, Monday - Friday.


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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward Glick can be reached on (571) 272 - 2490. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

HKS

11/26/04
HKS


EDWARD J. GLICK
SUPERVISORY PATENT EXAMINER